Guazuma ulmifolia

Salazar, Rodolfo; Jøker, Dorthe

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Guazuma ulmifolia Lam.

Taxonomy and nomenclature

Family: Sterculiaceae

Synonyms: *Guazuma guazuma* (L.) Cockerell, *G. polybotrya* Cav.,*G. tomentosa* H.B.K., *G. grandiflora* G. Don, *Theobroma guazuma* (L.) Poveda.

Vernacular/common names: Guácimo (Costa Rica); caulote (Honduras, El Salvador, Guatemala); cabeza de negro (Panamá); guacimillo (Nicaragua); Guácima (Rep. Dominicana); bacedar, bastard cedar (Trinidad, Jamaica).

A, Flowering branch; B, flower; C, fruits. Ill: CATIE.

Distribution and habitat

Widely distributed in tropical America from Mexico to the northern part of Argentina and the middle part of Brazil. Introduced to India more than 100 years ago and recently to Indonesia.

It is mostly found in the warm lowlands below 500 m altitude and with mean annual temperature above 24°C but can occasionally be found growing up to 1200 m altitude. Prefers annual rainfall of 700-1500 mm but can grow in areas with as much as 2500 mm rain/year.

As a pioneer species it grows best in full sunlight and colonises recently disturbed areas. It will grow on a variety of soils but is most common where pH is higher than 5.5. A common species in secondary forests.

Uses

In dry areas it is an important source of fodder for livestock, especially at the end of the dry season when there are no grasses. In many places farmers feed the leaves and fruits to cattle.

In young leaves crude protein content is 16-23% and digestibility 56-58%, in stems protein content is 7-8%, digestibility 31-36%. A study in Honduras showed that trees that were pruned four times a year produced 10 kg dry matter (leaves and young stems) per tree.

The wood is used for firewood, charcoal, posts and light construction. The seeds are edible, fresh or cooked.

Botanical description

Tree, 10-30 m tall and up to 60 cm in diameter, with rounded crown and drooping foliage. Bark is grey or grey-brown becoming furrowed and rough with age. Young branches are covered with stellate hairs. Leaves simple, alternate, with serrate margins, 5-7 cm long. Flowers yellow-brown, about 1 cm long in 3-5 cm long axillary inflorescences.

Fruit and seed description

The fruit is a round or elliptic 5-celled capsule that opens at the apex. When the fruit is ripe, it is black and contains 40-80 grey seeds, each 3-5 mm in diameter. There is approximately 100 g of clean seed in 1 kg of fruits and 150,000 clean seeds per kg.

Flowering and fruiting habit

A deciduous species except in very dry areas where the leaves drop at the end of the dry season. In areas with distinct bimodal climate, flowering occurs during the dry season. The fruits are ripe nearly a year later at the beginning of the dry season.

	Flowering	Fruiting
Puerto Rico	Mar-Oct	all year
Paraguay	Jan	July-Aug
Brazil	Jan-Sep	Aug-Sep
Costa Rica	Jan-Mar (2nd flowering in July)	Mar-Apr

Harvest

When the fruits have turned dark grey, they are harvested directly from the tree with extension hooks or cutters. The fruits are very susceptible to insect attacks when they are fully ripe.

Processing and handling

The seeds are extracted by macerating the fruits in a sack and then cleaned by sifting or in a thresher.

After cleaning the seeds are washed in abundant water to remove remains of the pulp and dried in the sun until they reach a moisture content of 8-10%.

Storage and viability

Seed storage behaviour is orthodox and the seeds should be stored in airtight containers. At room temperature they can only be stored for one year. In Costa Rica, seed stored for four years at 5°C retained a germination capacity of 40%.

Dormancy and pretreatment

Seeds require scarification to germinate. In Costa Rica the seeds are immersed in 80°C water for one or two minutes followed by 24 hours in cold, running water. After that, the seeds are cleaned for any remains of pulp. Others recommend to pour boiling water over the seeds, letting them soak for 30 seconds and then draining the water.

Sowing and germination

G. ulmifolia can be established by direct seeding, or by cuttings, root stumps or bare-root seedlings.

The seeds are sown in sand and covered with a thin layer of sand. When the seedlings have developed the first pair of leaves, they are transplanted to pots filled with equal amounts of sand and soil. After 14-16 weeks, when the plants are 25-30 cm tall, they are ready for planting in the field. For root stumps, plants are left in the nursery for 5-8 months or until they reach a stem diameter of 1.5-2.5 cm.

Phytosanitary problems

If the fruits are harvested late, they can be heavily attacked by insects of the family Anobiidae that enter the fruits and feed on the seeds.

Selected readings

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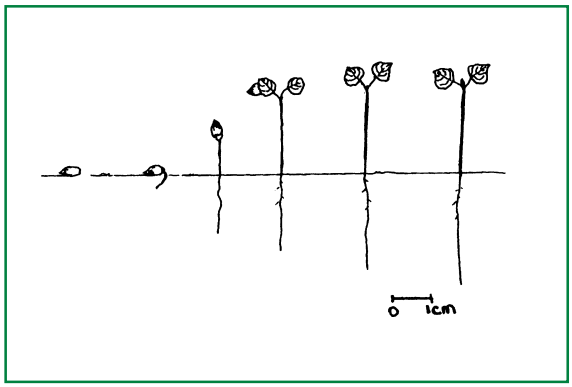

Stages in the germination of *Guazuma ulmifolia*. Ill.:CATIE.

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Authors: Rodolfo Salazar, CATIE
Dorthe Jøker, DFSC

Danida Forest Seed Centre
Krogerupvej 21
DK-3050 Humlebaek
Denmark

Phone: +45-49190500
Fax: +45-49160258
Email: dfsc@sns.dk
Website: www.dfsc.dk